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ABSTRACT

The education literature has not adequately considered the notion of change at its most fundamental level. This paper considers notions of institutional or social change from the ontological perspective of H. R. Maturana. The pattern of organization in living systems is defined by Maturana and Varela (1980) as "autopoiesis," a coined term which has three parts: (1) closed, self-bounded and autonomous; (2) self-generating; and (3) self-perpetuating. Autopoiesis is foundational not only to understanding the dynamic nature of human interactions but also to examining the potential of dialogic community for effecting systemic school reform. The paper explores whether social structures, like schools, are themselves living structures. It delineates the positions of Maturana, F. Varela, and N. Luhmann, and takes Maturana's position that social structures are not themselves living systems but the medium in which humans, as second-order autopoietic systems, operate. Finally, the paper explores how understanding the complex relationships among individuals with their environment, including forming dialogic communities, may enhance the ability of teachers to direct and participate in the renegotiation and exploration of alternative forms of social institutions like schools. Only with a better understanding of the relationship between individuals and social structures can people begin to address the question about how to affect change. (Contains 21 references.) (LMG)

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School Reform:
Dialogic Community as a Medium for
Reflection, Critique, and Change

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Abstract

The education literature has not done an adequate job with considering the notion of change at its most fundamental level. In this paper, we consider notions of institutional or social change from the ontological perspective of Maturana. The notion of autopoiesis is defined and argued to be foundational not only to understanding the dynamic nature of human interactions but to examining the potential of dialogic community for affecting systemic school reform. The notion whether social structures, like schools, for example, are themselves living structures is explored. The positions of Maturana, Varela, and Luhmann are delineated and we argue for Maturana's position that social structures are not themselves living systems but the medium in which humans, as second-order autopoietic systems, operate. Finally, we explore how understanding the complex relationships among individuals with their environment, including forming dialogic communities, may enhance the ability of teachers to direct and participate in the re-negotiation and exploration of alternative forms of social institutions like schools.

School Reform:

Dialogic Community as a Medium

for Reflection, Critique, and Change

There is much in the educational literature addressing school reform, teacher beliefs, and teacher change. Teacher reflection has become central to much of the research on teacher change. The relationship between practice and reflection, praxis, as emphasized by critical theorists (e.g. Freire, 1996) has been suggested to be key for teacher change to occur. Paradoxes occur, however, when we try to distinguish between psychological states and action orientation. What is the relationship between action and reflection, practice and beliefs, language and communication, community and individual?

In this paper, we will argue that finding a voice to articulate teacher change and school reform may be facilitated by reconceptualizing our understanding of social institutions and re-focusing on relational qualities of individuals within organizations. Our argument will start with an historical account of Maturana's ontology as a foundation for considering the relationships among individuals, actions, beliefs, reflection, and dialogic community. In order to reform education, we must understand the process of change and the structure of schools. This paper will provide a perspective on social organizational change and the role dialogic communities may play in school reform efforts.

Complex Adaptive Systems

Understanding change and our relationship to change involves an examination of 'what is' or ontology. A guiding metaphor for this paper comes from fifth century B.C.E. and the debates

between Heraclitus and Parmenides. Zeno, a student of Parmenides, proposed the following paradox.

> Zeno's Paradox of the arrow: Suppose an arrow is shot at a distant target. Its flight can be broken into an infinite number of moments. At any given moment the arrow must be at rest. What is in motion is really at rest. This is because each moment has zero time, and an infinity of zero times is still zero, meaning no motion is possible. Thus motion must be an illusion of judgment.

Zeno and his teacher Parmenides felt compelled to argue that motion was an illusion of the senses because their ontology specified that the omnipresence of god required all space to be occupied. How could we move into space already occupied? Motion, according to Zeno and Parmenides, must be an illusion of the senses!

Heraclitus' philosophy of becoming offers us a model of change consistent with Maturana's ontology and our own experiences of movement which includes arrows flying through the air. Heraclitus tried to explain motion and time using an analogy of a man stepping into a river. "You cannot step into the same river twice" reflected his position that change was the essence of being; without change, there would be no being. Both river and man change with time. Being is fluid, time is relative.

Within a view of nature as ever-changing and evolving, Heraclitus not only provided the space for change but revealed a perspective of being as fluid rather than fixed, indeterminate rather than determinate, participatory rather than objective, and connected rather than fragmented. Understanding and addressing our ideas about being is foundational to our being able to address knowing and change. Treating schools as social, complex organizations and analyzing the impact

of dialogic community on teacher change require understanding the organization of schools, at the macro level, and understanding the nature of dialogue and individual change, at the micro level. Recognizing the indeterminacy and dynamics of stepping in the river as changing both us and the river, we have chosen to approach our research on dialogic community from a complex adaptive systems perspective.

Indeterminacy, non-linearity, self-similarity, self-organization, chaos and order are characteristics of complex adaptive systems. Understanding organizational dynamics of both biological and social structures is a goal of complex adaptive systems research. Complex adaptive systems research has explored adaptive systems from three perspectives: autopoiesis, dissipative structures, and chaos dynamics. (See Dooley, 1997 for a discussion of these three approaches.) Given the organizational dynamics of teaching, the relative autonomy of teachers, and the emphasis we are placing in our own research on self-reflectivity and communication, we have chosen to explore the nature of dialogic community from the perspective of autopoiesis. Below is a summary of Maturana's theory of complex adaptive systems as autopoietic.

Complex Living Systems

Maturana (1980) explored the question: What does it mean to be living? Three approaches to this question were offered. The first approach, vitalism, was rejected immediately. Vitalism is the idea that some non-physical force is present within the physical system. The presence of this force characterizes the system as living. This perspective is portrayed in the bible as God breathed the breath of life into Adam.

The second approach to this question is characterized by Maturana as the approach he first attempted and is consistent with the scientific method. By trying to characterize or define

living systems by function or purpose, he proceeded by delineating the characteristics of living systems. This lead to two overwhelming difficulties. First, it seemed a perspective of when the list was complete required prior knowledge of what living systems were, an unforgivable circularity. Second, it seemed impossible to distinguish among living systems.

The third approach which Maturana developed was to focus on organization and pattern as defining characteristics of living systems. These ideas will be explored below.

Organization

The organization of a complex unity or system, living or non-living, according to Maturana, refers to the relations among the parts. Thus, "the relations between components that define a composite unity (system) as a composite unity of that particular kind, constitute its organization" (Maturana, 1980, p. xix). He distinguished between organization and structure, the latter referring to the actual components and relations holding between component parts. He goes on to explain, "the organization of a system, then specifies the class identity of a system, and must remain invariant. ... [T]he identity of a system may stay invariant while its structure changes within limits determined by its organization" (Maturana, 1980, p. xx). The notion of organizational identity is important for making sense of the second aspect of living systems, pattern of organization, as described through the process of autopoiesis.

Pattern of Organization in Living Systems

The pattern of organization in living systems is defined by Maturana and Varela (1980) as autopoiesis. Maturana (1980) describes the origin of this term this way:

> [O]ne day, while talking with a friend ... about an essay of his on Don Quixote de La Mancha, in which he analyzed Don Quixote's dilemma of whether to follow the

> path of arms (*præxis*, action) or the path of letters (*poiesis*, creation, production), and his eventual choice of the path of *præxis* deferring any attempt at *poiesis*, I understood for the first time the power of the word 'poiesis' and invented the word we needed: autopoiesis. (p. xvii).

Fleischaker (1990) summarizes Maturana and Varela's notion of autopoiesis as having three characteristics:

(1) Closed, self-bounded, and autonomous;

(2) Self-generating whereby all components of the system are produced by the system; and

(3) Self-perpetuating identity throughout change.

What characterizes a living system from non-living systems is the structural plasticity or ability of the system to undergo "structural changes as a result of interacting with itself, its environment, or other structurally plastic systems" (Dell, 1985, p. 13). The process of interacting with its environment is structural coupling, "that is, through recurrent interactions, each of which triggers structural changes in the system" (Capra, 1995, p. 219). As autonomous, self-generating systems, however, it is important to emphasize that, according to Maturana and Varela (1980), the environment does not cause change to occur. From the perspective of their structural determinism, causality and control are impossible. The structure of the system determines both the potential for self-generation and the potential for structural coupling with its environment. "The notion of causality is a notion that pertains to the domain of descriptions, and as such it is relevant only in the metadomain" (Maturana, 1980, p. xviii). The psychological experience of causality occurs when "we are able to couple ourselves to objects in such a way that we can bring about a predicted or desired outcome" (Dell, 1985, p. 9).

Living systems, therefore, are learning (cognitive) systems. As self-organizing, self-moderating, self-referential systems, systems adapt through the process of structural coupling. "It is the circularity of its organization that makes a living system a unit of interactions, and it is this circularity that it must maintain in order to remain a living system" (Maturana, 1980, p. 9).

Language and Self-Reflectivity

Current research on teacher change suggests the importance of self-reflectivity and the role language plays in facilitating reflection. What is communication both through self-reflection and among humans? What are the characteristics of language use?

Mingers (1995) applies Boulding's (1956) classification scheme for complex systems to Maturana and Varela. Building on relationships within the system, an hierarchy of levels of complexity is advanced. This hierarchy is useful for understanding linguistic relationships within Maturana and Varela's framework.

The lowest level organizational structures are mechanical, static systems like bridges and mountains (see Mingers, 1995, pp. 81-82). Simple mechanical systems follow at the second level. Clocks and flames on a stove are examples of open mechanical systems that require energy to combat entropy. Next are self-regulating systems which include thermostats or the body temperature system. These, too, are dynamic systems but, unlike clocks, they are self-regulating and incorporate negative feedback to the system to regulate the system. Next, at the fourth level, are simple autopoietic, living systems. The single cell is an example of a closed, self-regulated, self-generating, autopoietic (living) system. Multicellular systems which provide for structural coupling between cells, such as plants and fungi, are second order autopoietic systems and occur at the fifth level of Mingers' hierarchy. Sixth level complex systems include organisms with

nervous systems and are characterized by systems capable of interacting with their own internal states. "The state of relative nervous activity becomes itself an object of interaction for the nervous system, leading to further activity" (Mingers, 1995, p. 73). This level falls under the linguistic domain, revealing self-reflective coupling and abstract thought. The seventh level falls under the consensual domain and includes humans interacting with relations of relations. Language and self-consciousness occur at this level, described in more detail below. Finally, at the eighth level are social systems where structural coupling occurs between organisms. Families and ant colonies are examples of social systems. The relationship among these last three levels of systems needs further delineation.

Structural coupling is a key process for understanding how entities interact. "Communication, according to Maturana, is not a transmission of information, but rather a *coordination of behavior* among living organisms through mutual structural coupling" (Capra, 1995, p. 287). Learned communication is an example of linguistic behavior and, although not language, serves as the basis for language development. Maturana and Varela (1987) use the example of birdsongs as nonhuman communication among bird-pairs mated for life. "These animals ordinarily live in a dense forest with little or no visual contact. Under these conditions, mating couples form and coordinate through producing a common song. ... This melody is peculiar to each couple and is defined during the history of their mating" (Maturana & Varela, 1987, p. 194). This coordination of behavior is termed an *ontogenic phenomenon* to emphasize the ongoing structural change triggered by this coordinated activity.

Language, at the next level of complexity, is the coordination of linguistic behaviors or communication about communication. Capra uses the following example:

> Suppose that every morning my cat meows and runs to the refrigerator. I follow her, take out some milk, and pour it into a bowl, and the cat begins to lap it up. This is communication - a coordination of behavior through recurrent mutual interactions or structural coupling. Now suppose that one morning I don't follow the meowing cat because I know that I've run out of milk. If the cat were somehow able to communicate to me something like "Hey, I've now meowed three times; where is my milk?" that would be language. Her reference to her previous meowing would constitute a communication about communication. (Capra, 1995, p. 289).

At this level, there is the possibility of different levels of linguistic communications constructing differing levels of abstraction.

Coordinated communication about communication and the assignment of language to signify abstract concepts fall within the network of structural coupling at the highest level of complexity, social structures. Maturana and Varela describe social phenomena as follows:

> We call social phenomena those phenomena that arise in the spontaneous constitution of third-order couplings, and social systems the third-order unities that are thus constituted. ... We call *communication* the coordinated behaviors mutually triggered among the members of a social unity. (Maturana & Varela, 1987, p. 193).

Thus, social systems are

> network(s) of co-ordinates of actions. ... As such, a social system is a dynamic system in a continuous flow of changing co-ordinations of actions that remains the

> same as long as these stay contained within the configuration of co-ordinations of actions that defines it as a particular social system. (Maturana, 1988, pp. 67-68).

Language and communication are instrumental in the development of social structures as third-order couplings.

> [H]uman social systems are ... networks of conversations. Accordingly, different human social systems, or societies, differ in the characteristics of the different networks of conversations that constitute them. (Maturana, 1988, p. 68).

It seems logical to ask whether social structures as third-order couplings of autopoietic systems are autopoietic. Similarly, the relationship between autopoietic systems and living or organic systems has not yet been delineated. Recall that Maturana defined living systems as autopoietic, but are all autopoietic systems living? In particular, are social organizations autopoietic in the sense that Maturana and Varela have defined? Are they living systems? The following discussion relies heavily on the exploration of these questions by Mingers (1995).

Are All Autopoietic Systems Living?

There are three perspectives regarding the relationship between autopoietic and living systems. The first perspective places living (organic) systems as a subcategory of autopoietic systems. This perspective suggests there are classes of autopoietic systems which cannot be considered living, for example computer models of autopoietic systems and social systems. A primary criteria for this perspective is that living systems can only be organic but that not all autopoietic systems must be living.

The second perspective is that all autopoietic systems are living systems. The question that must be answered from this perspective, therefore, is whether social systems are autopoietic

and therefore living. Maturana and Varela hold this position that all autopoietic systems are living systems but that social systems are not autopoietic and therefore not living.

The third perspective restricts autopoiesis to living systems. This means social systems or autopoietic computer models, by definition, could not be considered living systems. This position is problematic, however, given that autopoiesis was developed by Maturana in the first place to define living systems. Stating that only living systems can be autopoietic restricts our knowing whether a system is living.

Focusing on the first two perspectives, therefore, it seems reasonable to ask whether social structures are autopoietic. The secondary issue becomes whether their being autopoietic requires them to be living in some sense of the word. Thus, the question whether social organizations, such as dialogic communities, schools, businesses, and abstract social constructs such as the law, government, or the economy, are autopoietic, will be explored below.

Are Social Systems Autopoietic?

Recall there are three conditions to be met in order for a system to be considered autopoietic:

(1) Closed, self-bounded, and autonomous;

(2) Self-generating whereby all components of the system are produced by the system; and

(3) Self-perpetuating identity throughout change.

In order to argue that social structures are autopoietic, boundaries must be defined and productions must be delineated. We will examine three approaches to exploring the question whether social systems are autopoietic. Because Maturana and Varela hold the second position above that all autopoietic systems are living systems, each argues that social structures are NOT

autopoietic. Their approaches to this issue are different, however, and will be treated separately. A third approach, that of Luhmann, will also be explored. He argues that social systems are autopoietic but non-physical. Thus, all three approaches hold the second perspective above that all autopoietic systems are living, deny that living systems must be organic, and place the burden for proof on the notion of defining boundaries and processes of production to decide whether a system is autopoietic.

Varela's Argument

Varela characterizes the problem this way: "[I]n order to say that a system is autopoietic, the production of components in some space has to be exhibited; further, the term production has to make sense in some domain of discourse" (Varela, 1981, p. 38 as cited by Mingers, 1995, p. 129). He argues that structural characteristics of social systems place components in operational or functional relationship rather than self-production or self-generating circularity. Social systems, he continues, are organizationally closed, autonomous, and structurally dependent but organizational aspects include networks of connections rather than self-generation. Therefore, he concludes, social structures are not autopoietic but retain important characteristics of autopoietic systems.

Maturana's Argument

Maturana claims "Living systems are cognitive systems, and living as a process is a process of cognition" (Maturana, 1980, p. 13). The question whether social systems are living systems therefore has implications for notions of cognition which, for Maturana, are related to autopoiesis. In what way, if social systems are defined as living systems, can it be said that social structures are cognitive, autopoietic structures?

Maturana argues that social systems are not autopoietic, living systems but are mediums for "second order autopoietic" entities, namely people. Social systems like families, therefore, "constitute a system that as a network of interactions and relations operates with respect to them as a medium in which they realize their autopoiesis" (Maturana, 1981, p. 11). Recall that according to Maturana, the environment and/or other organisms play triggering (perturbating) roles for autopoietic entities to affect change through the process of structural coupling. The organizational structure of the social system is a function of structural coupling of individuals and is an example of the consensual domain. "Consensual domain is thus a domain of arbitrary and contextual interlocking behaviors" (Mingers, 1995, p. 78) which coordinate action and are the medium in which second-order autopoietic systems operate. The importance of and relationship with linguistic behavior in the consensual domain anticipates Luhmann's position.

Luhmann's Argument

Luhmann argues that social systems are autopoietic. He contends social structures are organizationally closed and fulfill the production requirement by virtue of their self-referential nature. He denies, however, that physical, second-order autopoietic systems, namely people, comprise the social organizational structure and therefore disagrees with Maturana that living systems must have physical components. The basis for autopoiesis of social organization for Luhmann is communication. Quoted by Mingers, (1995, p. 141),

> Social systems use communications as their particular mode of autopoietic reproduction. Their elements are communications which are recursively produced and reproduced by a network of communications and which cannot exist outside such a network. (Luhmann, 1986, p. 174).

Luhmann sees communication as an on-going process of information selection, synthesis of utterance, and understanding. Each level of the communication process produces communication components and therefore the system is self-producing. Mingers provides the following example on Luhmann's behalf (Mingers, 1995, p. 143):

> In the law, a legal communication might be the judgment of a court. It contains a particular selection of information (the nature of the case, the main considerations, reference to laws and previous decisions - earlier communications); it is presented in a particular way (a speech, a written judgment); and it is interpreted in particular ways. The judgment as a whole leads to further communications, both directly through its consequences and indirectly as part of case law.

So communication is autopoietic and defines the patterns of structure within a social system to be communication events. Similarly, society is a social structure that has component parts (subsystems of organizational structure such as the law, politics, the economy, and education) and, according to Luhmann, is also autopoietic.

Implications of Autopoiesis in the Educational Domain

Hargreaves (1997) offers a list of educational change inhibitors. He claims change fails to become institutionalized when it:

(1) is poorly conceptualized;

(2) is too broad and ambitious;

(3) is too fast or too slow;

(4) is poorly resourced;

(5) lacks long-term commitment;

(6) lacks commitment from key staff;

(7) is opposed by parents;

(8) lacks community involvement;

(9) is pursued in isolation or is poorly coordinated (p. viii).

He claims "the literature has dealt relatively well with the technical aspects of educational change: how to build people's capacity to implement change, how to create strong professional cultures, ..., how to manipulate structures of scheduling and decision making" (Hargreaves, 1997, p. ix). We claim, however, that the literature has not done an adequate job with considering change at its most fundamental level. The questions: "What is change?" and "How does it occur?" have not been adequately de-constructed by change theorists, nor have underlying assumptions about social structures been examined to unveil the hidden implications of the interconnected nature of human development. Above, we have proposed considering notions of institutional or social change from the ontological perspective of Maturana. What does it mean, from this perspective, for individuals or social institutions to undergo change?

At the trivial level, individuals are continually changing. Living is an act of cognitive renewal. Just as Heraclitus cannot step into the same river twice, humans cannot help but change if they continue to live. Change at this level, the biological level, is a function of humans as second-order autopoietic systems.

The question of change of practice is a cultural question occurring within the consensual domain, considering human relations as third-order structural coupling of autopoietic systems. In our research on the role of dialogic community on teacher change, we have examined dialogic community from both interactional and cognitive perspectives (Pourdavood & Fleener, in press,

under review). Thus, our approach to understanding the nature of dialogue has been both cultural or systems-oriented and psychological. This approach is consistent with Maturana's notions of second-order autopoietic systems and communication within the consensual domain.

Implications for educational reform requires a second look at the nature of humans as second-order autopoietic systems. Autopoietic systems have identifiable boundaries, are self-producing and self-maintaining, are organizationally closed and structurally determined, and operate with their environment through the process of historical structural coupling. Finally, as second-order autopoietic systems, individuals are autonomous insofar as change occurs within the system and is not caused from outside the system.

The role of language in communicating requires extensive structural coupling. Structural coupling, according to Maturana, occurs both with other organisms and with the environment. Thus, we agree with Maturana that dialogic community seems to be a medium in which individuals communicate. Although we disagree with Luhmann's premise that communication transcends the biological relations among individuals and becomes an autopoietic structure with a life all its own, we too place communication both through exchange of ideas and critical reflection as important aspects of the dialogic process. As the medium for communication, dialogic community provides opportunities for structural coupling and mutual perturbation. Both aspects of communication are important for structural change within individuals as well as within communities as third-order coupling of autopoietic systems. The climate of the dialogic community selects the event through communication, but cannot and does not determine structural change within the participants. The structural change occurs from within the individuals and is intrinsically autonomous.

For Maturana "a conversation is an inextricable linking of language, emotion, and body, and the nervous system is the medium in which all intersect" (Mingers, 1995, p. 79). We view dialogic community as a meta-medium or second-order medium within the consensual domain. Thus, the dialogic community, as the medium of exchange, allows the autonomous individual, structurally coupled with the environment, to interactively combine emotive, language, and biological aspects of personhood. The language used, resulting from structural coupling, "is ultimately rooted in cooperative practical activity and its effects, rather than the abstract exchange of meaning and ideas" (Mingers, 1995, p. 79).

> As we realise our conversations through our interactions, and our interactions are realised through our bodyhoods, any change in our bodyhoods is liable to result in our conversations. Conversely, because we interact in the realisation of our conversations, and our interactions result in changes of our bodyhoods, our bodyhoods change in the course of our conversations in a course contingent on the flow of the interactions that constitute them. (Maturana, 1988, p. 68).

Thus, through the dialogic process, there is potential for interactive change to occur both within individuals and within the community.

Time after time we have seen educational innovations die within the confines of the classroom. Recognizing that outside influences cannot cause change, and respecting the structural autonomy of teachers require conceptualizing change in non-causal ways. Going back to the origins of the word 'autopoiesis,' how do we encourage "self-creation" or "self-invention"? Certainly enforced action, Quixote's "path of arms," will not work. "The realization of the

autopoiesis of the components of a social system is constitutive to the realization of the social system itself" (Maturana, 1980, p. xxv).

So if efforts to reform schools recognize and respect the autonomy of teachers, are we to be satisfied with the slow evolution of the massive system we call schooling based on consensual couplings? It seems we are at a crisis point in education. A consequence of Maturana's hierarchy of systems requires "to the extent that human beings are autopoietic systems, all their activities as social organisms must satisfy their autopoiesis" (Maturana, 1980, p. xxvi). Can we say the social structure of schools is providing this support? On the one hand, the trivial answer must be 'yes' because otherwise there would be no consensual participation. This ignores several realities including compulsory education, social needs for educated youth, and hierarchical/power structures that have evolved beyond the individuals involved in the perpetuation of schooling as a social structure.

Ecofeminism may provide some of the answers to our questions about school change. From a chaos systems approach, Perry recommends flooding the entire educational organization with alternatives (in this case, for countering gender prejudice) (Perry, 1993). Dialogic community may be the medium for generating alternatives and providing support to teachers engaged in change. Thus, as the medium for structural coupling, dialogic community may be synergistic for the production of new "ideas" and providing support for teachers engaged in change who may be experiencing difficulty with change.

> The teacher who is changing is clearly at risk. However, a community of teachers working together, telling stories, and experimenting with alternatives can provide a significant compensation. ... Once we understand that change involves the long and

> difficult process of teachers gaining their own agency and altering their perspective on knowledge and relationships, we will be well-advised to foster those democratic conditions which best encourage confidence and flexibility within teachers themselves. (Pradl, 1993, p. xxii).

Autopoiesis provides the structure and patterns of relationships to begin to understand complex social structures like schools. Change in social institutions, as with individuals, is structure-determined, depending not only on the nature of the autopoietic entities comprising the social institution, but on the history and context of the social institution itself. Just as Heraclitus acknowledged the complexity of change, so too have we approached school reform from the perspective that schools, as social institutions, are consensual, that change cannot be forced or controlled, that visions of reform must change as individuals within the system continually change, and that change itself is fluid through time.

Perhaps Bateson's (1972) metaphor for understanding difficult concepts like the relationship between individuals within social structures will provide some wisdom:

> I pictured the relation between ethos and cultural structure as being like the relation between a river and its banks - "the river molds the banks and the banks guide the river." ... When one is seeking an elucidation of one's own concepts, then one must look for analogies on an equally abstract level. (p. 83).

School reform and teacher change must be like the river and the banks - we control neither and their relationship is inextricably connected. Only with a better understanding of the relationship between individuals and social structures can we begin to address the question about how to affect change.

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